

Four New Species of *Aegialia* (s. str.) (Coleoptera: Scarabaeidae) From California and Nevada Sand Dunes

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ABSTRACT

Four new species of North American *Aegialia* (*magnifica*, *crescenta*, *hardyi*, and *concinna*) are described. A key to the North American species of *Aegialia* (s. str.) and illustrations of habitus, genitalia, and other morphological details are presented.

Current research on the ecology of sand dune areas in the western United States (principally in California and Nevada) is being conducted by Dr. Alan Hardy, California Department of Agriculture, Sacramento, and several co-workers. Members of the Scarabaeidae form a large segment of the beetles associated with sand dunes; several undescribed species have been collected including the four new *Aegialia* species described here.

Many of the dune systems being studied are under pressure from recreational and commercial interests, and the resulting use of the dunes often destroys them from the natural history point of view. Attempts are being made to have at least some areas of these dune systems preserved, and the presence of endemic species is one lever that can be used toward this end. For that reason we are describing these 4 species of *Aegialia*, each of which is apparently restricted to a particular set of dunes.

The North American species of *Aegialia* have not been studied as a whole since Brown's 1931 revision of the genus.

We have modified Brown's key to species of *Aegialia* (s. str.) to include the new species described here. Brown did not illustrate male genitalia. We have examined the male genitalia of all described species of *Aegialia* (where males are available) and include illustrations of those of the new species.

Brown's (1931) classification of the North American members of the Aegialiini resulted in the establishment of 2 genera, *Aegialia* Latreille and *Micraegialia* Brown. *Aegialia* is divided into 4 subgenera: *Leptaegialia* Brown, *Anomalae-gialia* Brown, *Psammoporus* Thomson, and *Aegialia* (s. str.). The 4 species described here all belong to the latter subgenus.

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Key to species of North American *Aegialia* (s. str.)

- | | |
|---|---|
| 1. Pronotum with basal marginal line strong, entirely visible (fig. 1) | 2 |
| Pronotum with basal marginal line absent or interrupted (fig. 2) | 9 |
| 2. Hind tibial spurs short, broad, foliaceous (fig. 11) | 3 |
| Hind tibial spurs slender, somewhat spatulate (fig. 9) | 6 |
| 3. Elytral striae feebly impressed, indistinct; apex of body extremely broad, | |

- convex; hind tibia with single, longitudinal row of tubercles on inner margin;
 southern California *convexa* Fall
- Elytral striae distinctly impressed; apex of body not extremely broad or convex;
 hind tibia with double row of tubercles; most of U. S. and southern Canada 4
4. Color pale brown to medium reddish brown *conferta conferta* Horn
- Color dark brown or nearly black 5
5. Pronotum finely, sparsely punctured; length 3.4 to 3.6 mm
 *conferta nigrella* Brown
- Pronotum with strongly impressed, coarse punctures; length 3.6 to 4.2
 mm *conferta punctata* Brown
6. Hind tibia without complete obliquely transverse ridges, a single longitudinal
 row of small tubercles present on inner margin, outer margin with irregular,
 large tubercles (fig. 9) *blanchardi* Horn
- Hind tibia with at least one complete obliquely transverse ridge, tubercles
 entirely lacking or only one or 2 present (fig. 12) 7
7. Color pale red; head smooth, lacking tubercles, granules or coarse punctures
 (fig. 1) *magnifica*, n. sp.
- Color dark brown to nearly black (except *concinna*); head rough, with either
 coarse punctures, or granules, or both 8
8. Length less than 3.6 mm; color pale brownish yellow; head granulate with
 some coarse punctures (fig. 4) *concinna*, n. sp.
- Length more than 3.7 mm; color dark brown to nearly black; head coarsely
 punctured, not granulate (fig. 2) *crescenta*, n. sp.
9. Hind tibial spurs foliaceous; length 3.0 to 3.7 mm *opifex* Horn
- Hind tibial spurs slender, somewhat spatulate (fig. 13) 10
10. Pronotum nearly impunctate, some fine, indistinct punctures on disc
 *arenaria* (F.)
- Pronotum coarsely punctured 11
11. Hind tibia with a complete, strong ridge at apical 2/3 (fig. 16) *hardyi*, n. sp.
- Hind tibia without a complete ridge, sometimes without a partial ridge 12
12. Pronotum densely, coarsely punctured throughout *latispina* LeConte
- Pronotum lacking punctures anteriorly and laterally, or punctures, if present,
 fine and indistinct 13
13. Pronotal punctures coarse basally, fine and indistinct apically and laterally ...
 *crassa crassa* LeConte
- Pronotal punctures fine basally, apical and lateral areas impunctate
 *crassa insularis* Brown

Aegialia (Aegialia) magnifica, new species

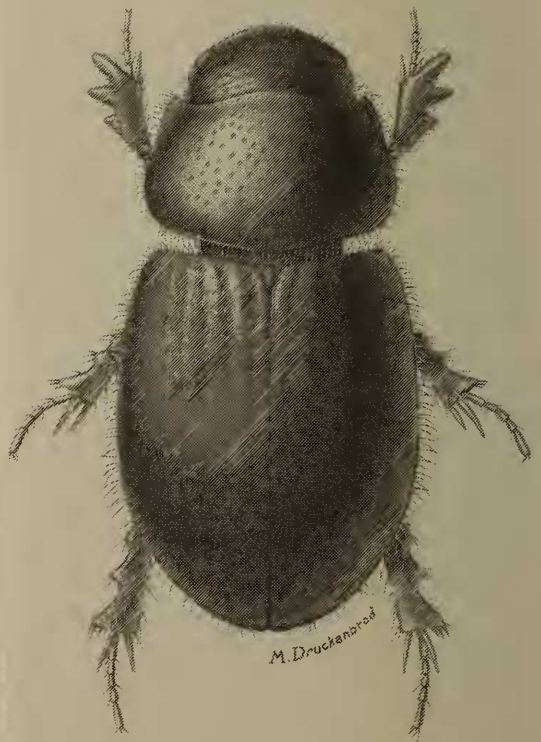
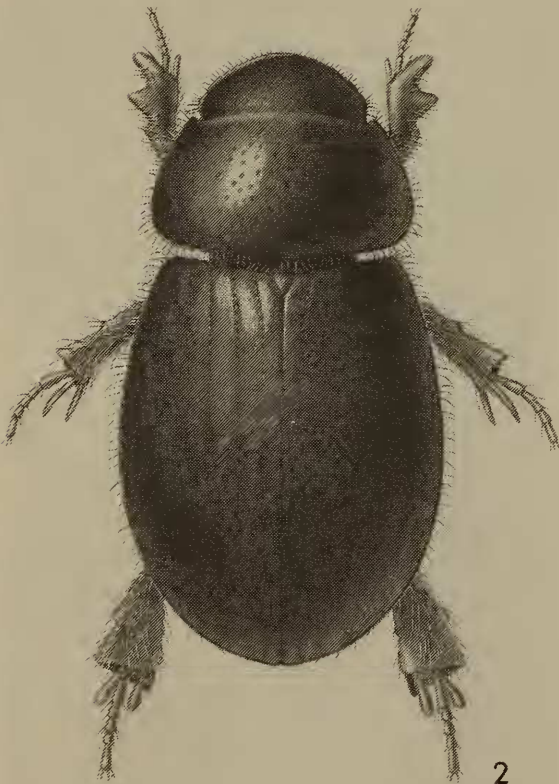
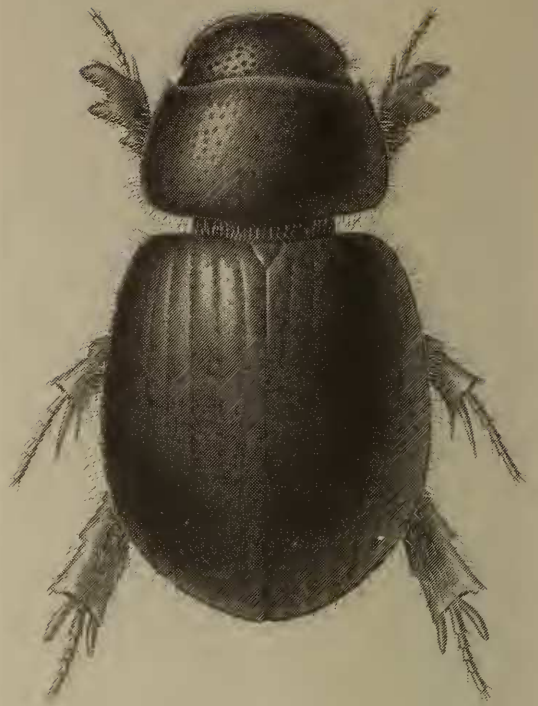
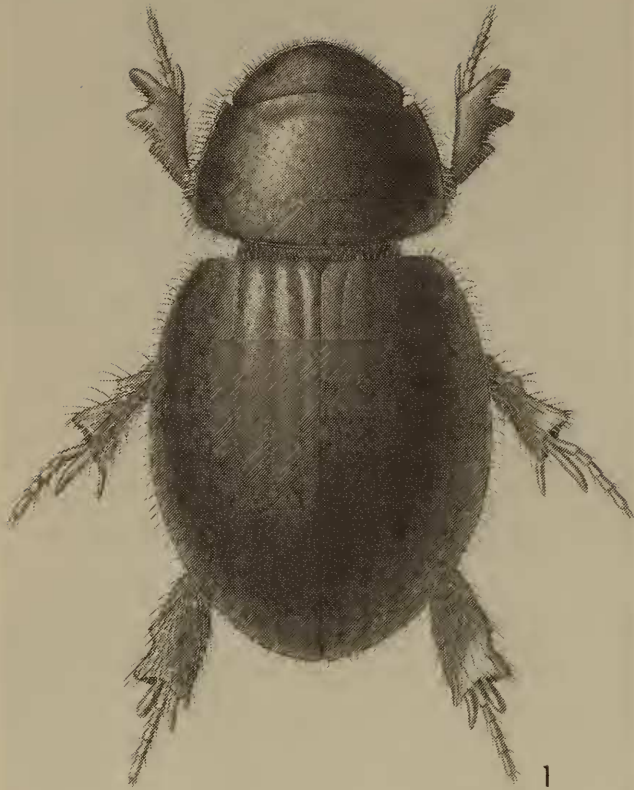
Holotype.—♂, length 5.40 mm, greatest width 2.85 mm. Form convex, oval, very broad posteriorly (fig. 1). Pale red; mouthparts and ventral surface yellowish red. Head smooth, shiny, finely alutaceous, fine punctures separated by a diameter or less, becoming coarser and denser at antero-lateral angle; clypeus very feebly emarginate medially, anterior margin evenly reflexed. Pronotum smooth, shiny, surface barely perceptibly alutaceous, fine punctures separated by less than to 3 times a diameter, lateral fovea absent; base with marginal line distinct, entire. Elytron smooth, shiny, punctures on intervals very fine, separated by 2 to 5 times a diameter, intervals flat; striae feebly impressed, finely punctured, punctures separated by 2 times a diameter. Metasternum shiny medially, becoming densely punctured with intermixed fine and coarse punctures laterally. Functional wings absent. Abdominal sterna densely, coarsely punctured, punctures separated by less than a diameter; apical sternum with elongate, median depression. Middle tibia smooth with strong, complete ridge at basal ¼, and strong, complete ridge present medially; hind tibia

broad apically, with incomplete ridge at basal ⅓, strong, complete ridge present at apical ⅔, surface smooth with fine, indistinct punctures (fig. 12); tibial spurs weakly spatulate (fig. 13); tarsus about ¾ as long as tibia. Genitalia as in fig. 5.

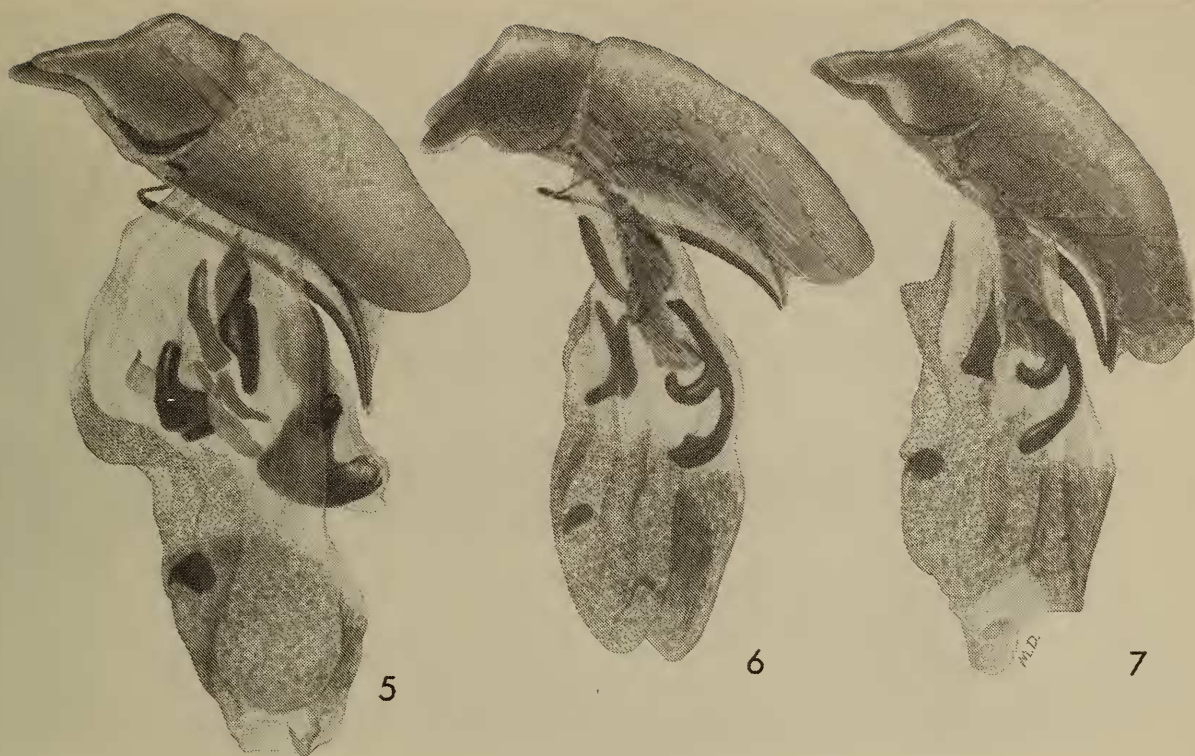
Allotype.—♀, length 5.55 mm, greatest width 3.0 mm. Similar to holotype except apical abdominal sterna without median impression.

Type-material.—Holotype, Nevada, Nye Co., "Big Dune", Amargosa Desert, 2500', IV-29-1974, Hardy & Eichlin (at light) (USNM 73838). Allotype, same data as for holotype (USNM). Paratypes, 348, locality same as for holotype, dates are as follows; 12-I-1972, 11-X-1972, 17-X-1972, 20-XI-1972, 19-XII-1972, 15-I-1973, 29-III-1974, 19-IX-1974, 28-IV-1975; collectors are as follows; F. G. Andrews and A. R. Hardy, Derham Giuliani, Neal Rulien: ecological data available is "sifting sand." Paratypes in collection of USNM, California Academy of Sciences, Alan Hardy, Neal Rulien and Henry Howden.

Variation.—Length ranges from 4.40 to 5.90 mm, width from 2.48 to 3.25 mm.



Figs. 1-4, habitus of *Aegialia* species. Fig. 1, *A. magnifica*; fig. 2, *A. crescenta*; fig. 3, *A. hardyi*; fig. 4, *A. concinna*.



Figs. 5-7, male genitalia of *Aegialia* species. Fig. 5, *A. magnifica*; fig. 6, *A. crescenta*; fig. 7, *A. hardyi*.

Remarks.—*A. magnifica* is the most distinctive species of North American *Aegialia* (s. str.) presently known. The red color, usually large size, and smooth dorsal surface are very characteristic, and even small examples are not easily confused with any other species. The presence of a distinct marginal line on the pronotal base causes *magnifica* to go to the *blanchardi* section of the key, but the male genitalia and hind tibiae indicate a close relationship to *crescenta*, n. sp., and *hardyi*, n. sp.

Aegialia (Aegialia) crescenta, new species

Holotype.—♂, length 4.25 mm, greatest width 2.40 mm. Form convex, oval (fig. 2). Dark reddish brown; ventral surface, legs and mouthparts pale yellowish brown. Head shiny, with band of coarse, nearly contiguous punctures from basal portion of clypeus to vertex; apical portion of clypeus less coarsely punctured, apical margin feebly emarginate medially, feebly reflexed. Pronotum smooth, shiny, disc with indistinct, feebly impressed furrow extending from base nearly to anterior margin, midline narrowly impunctate, rest of pronotum with coarse, sparse punctures separated by less than 1 to 3 times a diameter, feeble lateral fovea present; base with marginal line distinct, entire. Elytron smooth, shiny, intervals flat, punctures on intervals in single, slightly

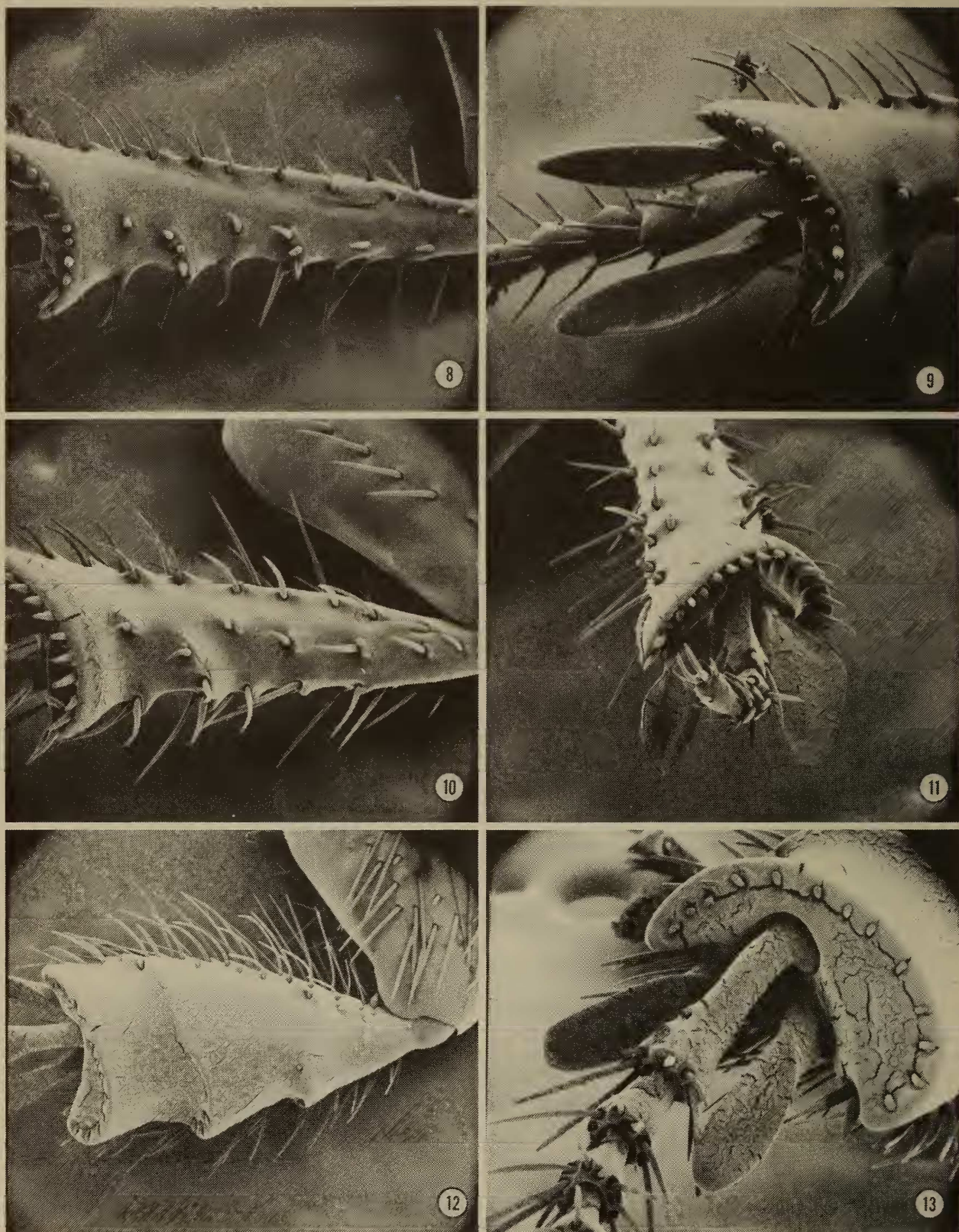
irregular, median row, separated by less than to 3 times a diameter; striae distinctly impressed, coarsely punctured, punctures separated by a diameter. Metasternum densely, finely punctured medially, intermixed fine and coarse punctures present laterally. Functional wings absent. Abdominal sterna strongly alutaceous, densely punctured; apical abdominal sternum with oval, median depression. Middle and hind tibiae and apical spurs as in figs. 14, 15. Genitalia as in fig. 6.

Allotype.—♀, length 4.60 mm, greatest width 2.55 mm. Similar to holotype except apical abdominal sternum without median depression.

Type-material.—Holotype, Nevada, Nye Co., Crescent Dune, 12-II-1976, Fred G. Andrews and Alan R. Hardy (USNM 73839). Allotype, same data as for holotype except date IV-24-1975 (USNM). Paratypes, 187, locality same as for holotype, dates differ as follows; 10-II-74, v-IV-75, 24-IV-75: some collected by Derham Giuliani. Paratypes in collections of USNM, California Academy of Sciences, Alan Hardy, and Henry Howden.

Variation.—Length ranges from 3.75 to 5.00 mm, width from 2.05 to 2.70 mm. The dorsal surface is somewhat alutaceous in some specimens, and the midline of the pronotum sometimes lacks any trace of a longitudinal furrow and may be sparsely punctured.

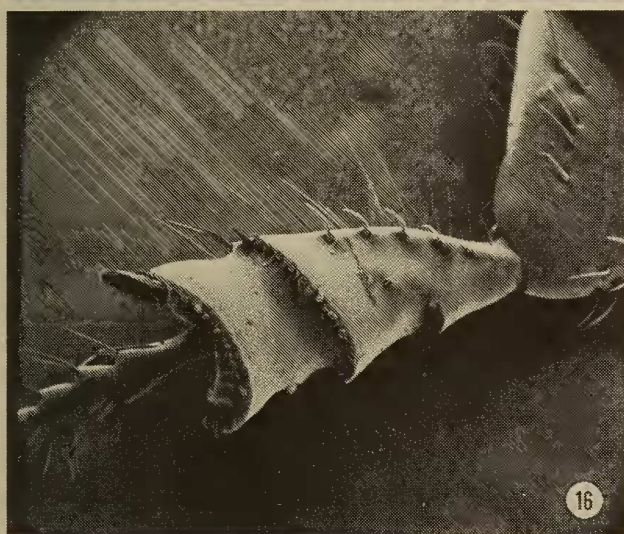
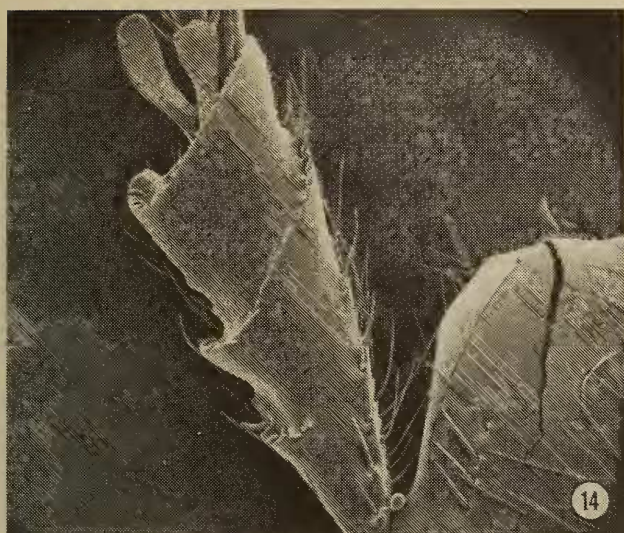
Remarks.—*A. crescenta* most nearly resembles *hardyi*, n. sp., and it is possible that these are merely disjunct



Figs. 8-13, hind tibiae and spurs of *Aegialia* species. Figs. 8 and 9, *A. blanchardi*; figs. 10 and 11, *A. conferta*; figs. 12, and 13, *A. magnifica*.

populations of a single species. However, because of the presence of a distinct marginal line on the pronotal base of *crescenta*, the sparse pronotal punctation of that species, and the genitalic differ-

ences (figs. 6, 7), we prefer to consider them as distinct species despite the absence of intermediate populations. Of the previously described species, *latispina* is most similar in appearance, but the hind



Figs. 14–17, hind tibiae and spurs of *Aegialia* species. Figs. 14 and 15, *A. crescenta*; figs. 16 and 17, *A. hardyi*.

tibia of *latispina* is of a completely different type than that of *crescenta*, as are the male genitalia.

The specific name is a neolatin noun referring to the type locality.

Aegialia (Aegialia) hardyi, new species

Holotype.—♂, length 4.50 mm, greatest width 2.38 mm. Description as for *crescenta* except differences noted as follows: head with vertex punctured; pronotal punctures coarse, dense, separated by a diameter or less, punctures present on midline, basal marginal line not visible in dorsal view (fig. 3), hind tibia and spurs as in figs. 16, 17; male genitalia as in fig. 7.

Allotype.—♀, length 5.10 mm, greatest width 2.60 mm. Similar to male except apical abdominal sternum without median depression.

Type-material.—Holotype, Nevada, Churchill Co., Sand Mountain Dunes, 16-IX-1974, Fred G.

Andrews and A. R. Hardy (USNM 73840). Allotype, Nevada, Churchill Co., Sand Mountain, 13-II-1973, Derham Giuliani (CAS). Paratypes, 16, same data as for holotype and allotype except as follows; Nevada, Churchill Co., Sand Mountain, 12 mi. S., 20 mi. E. Fallon, 28-II-1974. Paratypes in collections of USNM, California Academy of Sciences, and Alan Hardy.

Variation.—Length ranges from 4.33 to 5.10 mm, width from 2.25 to 2.60 mm.

Remarks.—See comments under description of *crescenta*. *A. hardyi* resembles *latispina* LeConte but the hind tibiae of *latispina* are tuberculate and lack any complete ridges. We take pleasure in naming this species for Alan Hardy in view of his active interest in the ecology of sand dunes and his efforts toward preserving this habitat.

Aegialia (Aegialia) concinna, new species

Holotype.—♀, length 3.52 mm, greatest width 1.80 mm. Form convex, elongate (fig. 4). Pale brownish yellow, ventral surface mostly paler than dorsum. Head mostly granulate with some close, coarse punctures, vertex smooth; apical margin of clypeus reflexed, barely perceptibly emarginate medially. Pronotum smooth, shiny, coarsely punctured, punctures separated by a diameter or less; base with distinctly visible marginal line. Elytron smooth, shiny, punctures on intervals nearly invisible, arranged in a single irregular row; striae deeply impressed, coarsely punctured, punctures separated by twice a diameter. Metasternum smooth, shiny medially, alutaceous with coarse punctures laterally. Functional wings absent. Abdominal sterna shiny, faintly alutaceous, finely punctured; apical and preapical sterna fused medially. Middle tibia slender, with a weak, incomplete ridge at basal $\frac{1}{4}$ and strong, complete ridge at middle; hind tibia slender, with incomplete ridge at basal $\frac{1}{3}$ and incomplete ridge at apical $\frac{2}{3}$, surface smooth, lacking punctures; tibial spurs slender, feebly spatulate.

Type-material.—Holotype, California, Fresno Co., 18 mi. SW Mendota, Sec. 15 T16S R13E,

27-II-1975, G. Andrews, E. L. Paddock and A. J. Gilbert collectors (USNM 73841). Paratypes, 3, same data as for holotype. Paratypes in collections of USNM and Alan Hardy.

Variation.—Length ranges from 3.33 to 3.52 mm, width from 1.75 to 1.80 mm.

Remarks.—The small size, pale color, and slender, smooth hind tibiae distinguish *concinna*. No close relationship with any known species of *Aegialia* (s. str.) is apparent, and the lack of males makes genitalic comparisons impossible. The presence of a completely visible basal marginal line on the pronotum places *concinna* in the *blanchardi* section of the key but there is no phyletic significance to this association.

Reference Cited

- Brown, W. J. 1931. Revision of the North American Aegialiinae (Coleoptera). Canadian Entomol. 63: 9–19, 42–49.